

IN THE CLAIMS

1. (Currently Amended) An information transmitting apparatus which transmits a plurality of signals ~~after multiplexing these~~, said signals including at least video signals and audio signals, to an information receiving apparatus, said information transmitting apparatus comprising:

a plurality of encoding means for separately encoding each of said video signals and each of said audio signals;

first multiplexing means for multiplexing ~~the plurality of signals~~ a plurality of pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal; and

second multiplexing means for multiplexing the multiplexed plurality of pairs of encoded video signals and encoded audio signals; and

control means for controlling a multiplexing ratio among the plurality of signals in the second multiplexing means.

2. (Original) The information transmitting apparatus according to claim 1, wherein the transmitting apparatus transmits the plurality of signals as a single transport stream.

3. (Original) The information transmitting apparatus according to claim 1, further comprising database means for providing data that relates to transmission rates of the plurality of signals at each time point, wherein the control means controls the multiplexing ratio while referring to the database means.

4. (Currently Amended) The information transmitting apparatus according to claim 1, ~~further comprising encoding means for one of the plurality of signals~~, wherein the control means controls an output rate of ~~the~~ each of the plurality of encoding means.

5. (Currently Amended) The information transmitting apparatus according to claim 1, wherein the plurality of signals ~~are program information, a video signal, and an audio signal~~ further comprise program information.

6. (Currently Amended) An information transmitting apparatus which transmits program information ~~after multiplexing it with a video signal and an audio signal, to an information receiving apparatus, said information transmitting apparatus comprising:~~ receiving apparatus, said information transmitting apparatus comprising:

a plurality of video encoding means for encoding ~~the~~ each video signal;

a plurality of audio encoding means for encoding ~~the~~ each audio signal;

program information data generating means for generating data of the program information;

first multiplexing means for multiplexing the data of the program information that is output from the program information data generating means with encoded video data that is output from the plurality of video encoding means and encoded audio data that is output from the plurality of audio encoding means in order to form pairs of multiplexed data; and

second multiplexing means for multiplexing the pairs of multiplexed encoded video data, encoded audio data and data of the program information; and

control means for controlling a data output rate of each of the plurality of video encoding means, a data output rate of each of the plurality of audio encoding means, a data output rate of the program information data generating means, and a multiplexing ratio among the encoded video data, the encoded audio data, and the data of the program information in the second multiplexing means.

7. (Currently Amended) An information transmitting method for transmitting a plurality of signals ~~after multiplexing those~~, said signals including at least video signals and audio signals, to an information receiving apparatus, said information transmitting method comprising:

an encoding step for separately encoding each of said video signals and each of said audio signals;

a first multiplexing step of for multiplexing the plurality of signals a plurality of pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal; and

a second multiplexing step for multiplexing the multiplexed plurality of pairs of encoded video signals and encoded audio signals; and

a control step of for controlling a multiplexing ratio among the plurality of signals in the second multiplexing step.

8. (Original) The information transmitting method according to claim 7, wherein the control step controls the multiplexing ratio while referring to data that relates to transmission rates of the plurality of signals at each time point.

9. (Currently Amended) The information transmitting method according to claim 7, wherein the plurality of signals are ~~program information, a video signal, and an audio signal~~ further comprise program information.

10. (Currently Amended) An information transmitting method for transmitting program information ~~after multiplexing it with a video signal and an audio signal to an information receiving apparatus, said information transmitting method, characterized by~~ comprising:

a video encoding step of encoding ~~the~~ each video signal of each of a plurality of video encoding means;

an audio encoding step of encoding ~~the~~ each audio signal of each of a plurality of audio encoding means;

a program information data generating step of generating data of the program information;

a first multiplexing step of multiplexing the data of the program information that is output by the program information data generating step with encoded video data that is output by the video encoding step and encoded audio data that is output by the audio encoding step in order to form pairs of multiplexed data; and

a second multiplexing step for multiplexing the pairs of multiplexed encoded video data, encoded audio data and multiplexed data of the program information; and

a control step of controlling a data output rate of each of the plurality of video encoding means in the video encoding step, a data output rate of each of the plurality of audio encoding means in the audio encoding step, a data output rate of the program information data generating step, and a multiplexing ratio among the encoded video data, the encoded audio data, and the data of the program information in the second multiplexing step.

11. (Currently Amended) A provider for providing a computer-readable program for causing an information transmitting apparatus which transmits a plurality of signals ~~after multiplexing these, said signals including at least video signals and audio signals, to an~~ information receiving apparatus to execute a process comprising:

an encoding step for separately encoding each of said video signals and each of said audio signals;

a first multiplexing step ~~of for multiplexing the plurality of signals~~ a plurality of pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal; and

a second multiplexing step for multiplexing the multiplexed plurality of pairs of encoded video signals and encoded audio signals; and

a control step ~~of for~~ controlling a multiplexing ratio among the plurality of signals in the second multiplexing step.

12. (Original) The provider according to claim 11, wherein the control step controls the multiplexing ratio while referring to data that relates to transmission rates of the plurality of signals at each time point.

13. (Currently Amended) The provider according to claim 11, wherein the plurality of signals are ~~program information, a video signal, and an audio signal~~ further comprise program information.

14. (Currently Amended) A provider for providing a computer-readable program for causing an information transmitting apparatus which transmits program information ~~after multiplexing it with a video signal and an audio signal~~ to an information receiving apparatus, to execute a process comprising:

a video encoding step of encoding ~~the~~ each video signal of each of a plurality of video encoding means;

an audio encoding step of encoding ~~the~~ each audio signal of each of a plurality of audio encoding means;

a program information data generating step of generating data of the program information;

a first multiplexing step of multiplexing the data of the program information that is output by the program information data generating step with encoded video data that is output by the video encoding step and encoded audio data that is output by the audio encoding step in order to form pairs of multiplexed data; ~~and~~

a second multiplexing step for multiplexing the pairs of multiplexed encoded video data, encoded audio data and data of the program information; and

a control step of controlling a data output rate of each of the plurality of video encoding means in the video encoding step, a data output rate of each of the plurality of audio encoding means in the audio encoding step, a data output rate of the program information data generating step, and a multiplexing ratio among the encoded video data, the encoded audio data, and the data of the program information in the second multiplexing step.

15. (Currently Amended) An information receiving apparatus which receives multiplexed program information that is ~~multiplexed with a video signal and an audio signal~~ and displays the ~~program information together with the video signal~~ comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, said information receiving apparatus comprising:

separating means for separating the multiplexed program information ~~that is multiplexed with the video signal and the audio signal~~;

a plurality of decoding means for separately decoding each of the video signals and each of the audio signals;

storing means for storing the program information separated by the separating means; and

control means for controlling operations of the separating means and the storing means in accordance with a transmission rate of the program information.

16. (Currently Amended) The information receiving apparatus according to claim 15, wherein the control means controls the operations of the separating means and the storing means so that the program information is acquired only in a ~~prescribed~~ predetermined period when the transmission rate of the program information is high.

17. (Currently Amended) An information receiving method for receiving program information that is ~~multiplexed with a video signal and an audio signal and displaying the program information together with the video signal~~ comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, said information receiving method comprising:

a separating step ~~of~~ for separating the multiplexed program information ~~that is multiplexed with the video signal and the audio signal;~~

a decoding step for separately decoding each of the video signals and each of the audio signals;

a storing step ~~of~~ for storing the program information separated by the separating ~~means~~ step; and

a control step ~~of~~ for controlling operations of the separating step and the storing step in accordance with a transmission rate of the program information.

18. (Currently Amended) The information receiving method according to claim 17, wherein the control step controls the operations of the separating ~~means~~ step and the storing ~~means~~ step so that the program information is acquired only in a ~~prescribed~~ predetermined period when the transmission rate of the program information is high.

19. (Currently Amended) A provider for providing a computer-readable program for causing an information receiving apparatus which receives program information that is ~~multiplexed with a video signal and an audio signal and displays the program information together with the video signal~~ comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, to execute a process comprising:

a separating step ~~of~~ for separating the multiplexed program information ~~that is multiplexed with the video signal and the audio signal;~~

a decoding step for separately decoding each of the video signals and each of the audio signals;

a storing step ~~of~~ for storing the program information separated by the separating ~~means~~ step; and

a control step ~~of~~ for controlling operations of the separating step and the storing step in accordance with a transmission rate of the program information.

20. (Currently Amended) The provider according to claim 19, wherein the control step controls the operations of the separating ~~means~~ step and the storing ~~means~~ step so that the program information is acquired only in a ~~prescribed~~ predetermined period when the transmission rate of the program information is high.

21. (Currently Amended) A broadcasting system having an information transmitting apparatus which transmits program information ~~after multiplexing it with a video signal and an audio signal and~~ to an information receiving apparatus which receives the multiplexed program information that is multiplexed with the video signal and the audio signal and displays the program information together with the video signal comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, the information transmitting apparatus comprising:

a plurality of video encoding means for encoding the each video signal;

a plurality of audio encoding means for encoding the each audio signal;

program information data generating means for generating data of the program information;

first multiplexing means for multiplexing the data of the program information that is output from the program information data generating means with encoded video data that is output from the plurality of video encoding means and encoded audio data that is output from the plurality of audio encoding means in order to form pairs of multiplexed data; and

second multiplexing means for multiplexing the pairs of multiplexed encoded video data, encoded audio data and data of the program information; and

control means for controlling a data output rate of each of the plurality of video encoding means, a data output rate of each of the plurality of audio encoding means, a data output rate of the program information data generating means, and a multiplexing ratio among the encoded video data, encoded the audio data, and the data of the program information in the second multiplexing means, and

the information receiving apparatus comprising:

separating means for separating the multiplexed program information ~~that is multiplexed with the video signal and the audio signal;~~

a plurality of decoding means for separately decoding each of the video signals and each of the audio signals;

storing means for storing the program information separated by the separating means; and
control means for controlling operations of the separating means and the storing means in accordance with a transmission rate of the program information.

22. (Currently Amended) An information transmitting apparatus which transmits program information ~~after multiplexing it with a video signal and an audio signal;~~ to an information receiving apparatus, said information transmitting apparatus comprising:

program information data generating means for generating program information data including information of a transmission status of the program information; ~~and~~

first multiplexing means for multiplexing the program information data generated by the program information data generating means with an encoded version of the video signal and an encoded version of the audio signal a plurality of pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal; and

second multiplexing means for multiplexing the multiplexed plurality of pairs of encoded video signals and encoded audio signals.

23. (Currently Amended) An information transmitting method for transmitting program information ~~after multiplexing it with a video signal and an audio signal, to an information receiving apparatus, said information transmitting method~~ comprising:

a program information data generating step ~~of~~ for generating program information data including information of a transmission status of the program information; ~~and~~

a first multiplexing step ~~of~~ for multiplexing the program information data generated by the program information data generating means with ~~an encoded version of the video signal and an encoded version of the audio signal~~ a plurality of pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal; and

a second multiplexing step for multiplexing the multiplexed plurality of pairs of encoded video signals and encoded audio signals.

24. (Currently Amended) A provider for providing a computer-readable program for causing an information transmitting apparatus which transmits program information ~~after multiplexing it with a video signal and an audio signal~~ to an information receiving apparatus, to execute a process comprising:

a program information data generating step ~~of~~ for generating program information data including information of a transmission status of the program information; and

a first multiplexing step ~~of~~ for multiplexing the program information data generated in the program information data generating means with ~~an encoded version of the video signal and an encoded version of the audio signal~~ a plurality of pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal; and

a second multiplexing step for multiplexing the multiplexed plurality of pairs of encoded video signals and encoded audio signals.

25. (Currently Amended) An information receiving apparatus which receives multiplexed program information that is ~~multiplexed with a video signal and an audio signal and displays the program information together with the video signal~~ comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, said information receiving apparatus comprising:

separating means for separating the multiplexed program information ~~data that is multiplexed with the video signal and the audio signal~~; and

a plurality of decoding means for separately decoding each of the video signals and each of the audio signals; and

extracting means for extracting information of a transmission status of the program information that is included in the program information data separated by the separating means.

26. (Currently Amended) An information receiving method for receiving multiplexed program information that is ~~multiplexed with a video signal and an audio signal and displaying the program information together with the video signal~~ comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, said information receiving method comprising:

a separating step ~~of~~ for separating the multiplexed program information ~~data that is multiplexed with the video signal and the audio signal~~; and

a decoding step for separately decoding each of the video signals and each of the audio signals; and

an extracting step ~~of~~ for extracting information of a transmission status of the program information that is included in the program information data separated by the separating ~~means~~ step.

27. (Currently Amended) A provider for providing a computer-readable program for causing an information receiving apparatus which receives multiplexed program information ~~that is multiplexed with a video signal and an audio signal and displays the program information together with the video signal~~ comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, to execute a process comprising:

a separating step ~~of~~ for separating the multiplexed program information data ~~that is multiplexed with the video signal and the audio signal; and~~

a decoding step for separately decoding each of the video signals and each of the audio signals; and

an extracting step ~~of~~ for extracting information of a transmission status of the program information that is included in the program information data separated by the separating means step.

28. (Currently Amended) A broadcasting system having an information transmitting apparatus which transmits program information ~~after multiplexing it with a video signal and an audio signal and to an information receiving apparatus which receives the multiplexed program information that is multiplexed with the video signal and the audio signal and displays the program information together with the video signal~~ comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video signal and one encoded audio signal, the information transmitting apparatus comprising:

program information data generating means for generating program information data

including information of a transmission status of the program information; ~~and~~

first multiplexing means for multiplexing the program information data generated by the program information data generating means with ~~an encoded version of the video signal and an encoded version of the audio signal~~, a plurality of pairs of encoded video signals and encoded audio signals; and

second multiplexing means for multiplexing the multiplexed plurality of pairs of encoded video signals and encoded audio signals; and

the information receiving apparatus comprising:

separating means for separating the multiplexed program information data ~~that is multiplexed with the video signal and the audio signal~~; and

extracting means for extracting information of a transmission status of the program information that is included in the program information data separated by the separating means.